EFFECT OF ANTHROPOMETRIC MEASUREMENTS AND PERSONAL DATA PARAMETERS ON BENIGN PROSTATIC HYPERPLASIA AND CARCINOMA PROSTATE

Zehra Naz, Saadia Anjum*
Department of Biochemistry, Islamic International Medical College, Rawalpindi, *Frontier Medical College, Abbottabad, Pakistan

Background: With advancing age the chances of benign prostatic hyperplasia (BPH) and carcinoma prostate (CaP) increases. Although previous studies on physical parameters and personal data parameters have shown the positive associations between BMI, family history, and marital status but they have not seen the effect of occupation and socioeconomic status on BPH and CaP. The objective of the present study was to see the effects of anthropometric measurements and personal history parameters on BPH and CaP in our community.

Methods: Ninety-three willing subjects from the outpatient department of Sindh Institute of Urology and Transplantation (SIUT) were selected for the study. Height and weight were measured, BMI calculated and personal data information, i.e., occupation, marital status, smoking history, family history and socioeconomic history were recorded. Data were analysed for association of various parameters with BPH and CaP.

Results: Significant association between weight, BMI and skilled labourers was found when normal were compared with BPH cases.

Conclusion: No significant association between other parameters and BPH, CaP cases was found, except weight, BMI and skilled labour. Body weight should be managed well as it can lead to both cardiovascular as well as prostatic diseases.

Keywords: Body mass index, Benign Prostatic Hyperplasia, CaP, Carcinoma prostate

INTRODUCTION

With advancing age the chances of benign prostatic hyperplasia (BPH) and carcinoma prostate (CaP) increases.1-3 Age and dihydrotestosterone (DHT)4 have been found to play an important role in the development of BPH whereas, age, race, family history, androgens, estrogens and other environmental factors have a great impact on CaP.5

As the population ages and other causes of disability and death are brought under control the burden of prostate cancer will continue to increase. In Pakistan it’s the most common cancer6 and is the second leading cause of death from cancer. More than one million men of more than 50 years of age who are alive today in the US are destined to die of prostate cancer unless better methods of prevention and treatment are found. The American Cancer Society estimated 3,334,500 new cases (revised to 209,900) and 41,800 deaths from prostate cancer in the US in 1997. This disease now accounts for 32% of cancers and 14% of cancer deaths in American men. The figures are similar in most Western countries, with the highest rate adjusted mortality rates in Scandinavian countries.7 When compared with white men, black men are diagnosed with prostate cancer at a younger age.8

Several studies have identified family history as a risk factor for prostate cancer incidence, typically associated with a two to four fold increase in risk. Some investigators have found that younger men are at a higher risk of family history associated prostate cancer than older men, suggesting that cancers developing due to genetic factors occur early in life. Risks associated with a history on the father’s side of the family and in a brother were similar.9

Since age, family history, smoking have impact on many types of cancers, therefore, this study was designed to see the effects of anthropometric measurements, i.e., height, weight, body mass index (BMI), and personal data parameters, i.e., occupation, marital and socioeconomic status, in addition to the above mentioned factors in our community.

SUBJECTS AND METHODS

Subjects randomly enrolled for the study were 250 but only ninety-three were willing to participate in the study. These subjects were selected from out patients department of Sindh Institute of Urology and Transplantation (SIUT), Karachi. All the subjects were of 40 years and above in age. The subjects were divided onto 3 groups consisting of normal, BPH and CaP cases; each group was comprised of thirty-one subjects.

Verbal consent was obtained from the subjects. A performa regarding general information about age, occupation, marital status, smoking history, family and socioeconomic history was duly filled. Anthropometric measurements like height (Cm) and weight (Kg) were measured and body mass index (BMI) was calculated.2

Values like age, height, weight, BMI, duration of smoking and the number of cigarettes per day were expressed as mean and standard error of mean (SEM), and Student’s t-test was applied. Chi-square test was applied to find an association among occupation, marital status, smoking, family and socioeconomic history with normal, BPH and CaP cases.
RESULTS
Table-1 shows the age, height, weight and BMI of the subjects. Table-2 shows the comparison of physical parameters in normal, BPH and CaP cases. There was no statistically significant difference in age and height of subjects of these groups. Weight was statistically significant (p<0.05) in normal versus BPH cases, whereas non-significant in normal versus CaP and BPH versus CaP cases. Body mass index was statistically significant (p<0.05) when we compared normal with BPH cases.

Table-3 shows the association of occupation, marital status, smoking, family and socioeconomic history with normal, BPH and CaP cases. Regarding occupation, subjects of the 3 groups, i.e., normal, BPH, and CaP cases were divided into office workers, skilled labourers, hard labourers and jobless. When compared normal with BPH, for skilled labourers differences were significant (p=0.01), whereas in office workers and hard labourers they were statistically non-significant. When compared normal with CaP cases, and BPH with CaP cases results were statistically non-significant.

Regarding marital status, when comparing normal with BPH cases, Normal with CaP cases and BPH with CaP cases, the results were statistically non-significant. Considering smoking, results showed independence of these three groups with smoking ($\chi^2$=0.99, p=0.95). Duration of smoking in normal, BPH and CaP cases was 9.82±1.90, 13.88±3.17 and 14.5±3.69 respectively. There was no significant association of duration of cigarettes smoked among any of the three groups. Association of family history with normal, BPH and CaP cases, showed no dependency on family history in these groups ($\chi^2$=0.89, p=0.63) In normal, BPH and CaP cases there was no dependency on socioeconomic status ($\chi^2$=4.66, p=0.09).

DISCUSSION
Benign prostatic hyperplasia and CaP are diagnosed on the basis of transrectal ultrasound (TRUS) and biopsy, but certain factors like age, family history; environmental causes etc. also play an important role. Consideration of factors that can influence these prostatic diseases should be emphasised whenever we talk of economical burden of a disease.

In the present study, analysis of physical characteristics such as age, height, weight and BMI revealed non-significant association of the first 2 characteristics. This is perhaps understandable and self-explanatory, and needs no discussion. The researchers

Table-1: Anthropometric measurements in normal, benign prostatic hyperplasia and carcinoma prostate cases (Mean±SEM)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal (n=31)</th>
<th>BPH (n=31)</th>
<th>CaP (n=31)</th>
<th>Total</th>
<th>Normal vs. BPH</th>
<th>Normal vs. CaP</th>
<th>BPH vs. CaP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>62.90±1.62</td>
<td>62.90±1.62</td>
<td>64.19±1.65</td>
<td>62.90</td>
<td>0.09</td>
<td>0.2*</td>
<td>0.2*</td>
</tr>
<tr>
<td>Height (Cm)</td>
<td>166.15±0.84</td>
<td>165.68±1.12</td>
<td>163.88±1.88</td>
<td>166.15</td>
<td>0.63</td>
<td>0.33*</td>
<td>0.33*</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>68.70±2.52</td>
<td>61.33±2.45</td>
<td>63.81±2.46</td>
<td>68.70</td>
<td>0.33</td>
<td>0.58</td>
<td>0.58</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>24.96±0.82</td>
<td>22.35±0.77</td>
<td>23.72±0.63</td>
<td>24.96</td>
<td>0.09</td>
<td>0.74</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Table-2: Anthropometric measurements of normal, benign prostatic hyperplasia and carcinoma prostate cases

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal vs. BPH</th>
<th>Normal vs. CaP</th>
<th>BPH vs. CaP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>t</td>
<td>df</td>
<td>p</td>
</tr>
<tr>
<td>0.33</td>
<td>60</td>
<td>0.74</td>
<td>0.56</td>
</tr>
<tr>
<td>Height (Cm)</td>
<td>0.33</td>
<td>60</td>
<td>1.09</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>2.08</td>
<td>60</td>
<td>0.05*</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>2.29</td>
<td>60</td>
<td>0.05*</td>
</tr>
</tbody>
</table>

*Significant
failed to find any study (in case of height) conducted in the past also, with a positive and significant association. However the later two factors (weight and BMI) showed significance when normal and BPH cases were compared. Arruda et al.16 conducted a study on Amazon community for the sole purpose of verifying the occurrence and investigating any possible association of CaP with overweight (BMI). Only 22 men aged 55 years and above were included in the study. 68.1% were found to be over weight. Irani et al.11 found similar values of BMI in BPH and CaP as seen in the present study.

Freeland and Platz12 found by reviewing the data that there is a positive association of obesity and prostate cancer. Wernyl et al.13, Rundle and Neugut14, and Price et al.15 had found the effect of increasing weight but it is on PSA, i.e., with increasing weight and BMI there is a decline in PSA.

In our study marital status was not found to be associated with BPH and CaP cases. Mills et al.16 also found no significant association of marital status with CaP case. Weinrich et al.17 had smaller proportion of single men; while in present study only one subject was unmarried.

When comparing normal with BPH cases for skilled labourers, results were significant (p<0.01), other results were non-significant. Mills and Yang18 in their study reported that specific occupational factors have not yet been identified. Their study population only belonged to farmer community (some subjects in present study were farmers but not all). Mills and Yang also found that the risk of CaP was not associated with pattern of employment in any commodity; and that it appeared to be associated with the chemicals used in pesticides.

Regarding smoking history, no association was found between cigarette smoking and BPH, CaP case. Smoking is most likely not associated with prostate cancer incidence; however there is some evidence that smoking may be positively associated with mortality from this cancer. Mills et al.16 found that cigarette smoking was not a discernible trend in risk, in case of CaP. Researchers failed to find any other study showing a positive association between smoking and prostate diseases, although extensive work has been done in this respect with other types of cancers. Again this study appears to be one of the first few ever conducted in this subject.

Present study showed no association of family history with BPH and CaP. A number of studies conducted in the past namely, Kalish et al., Lichtenstein et al.,16 Catalona et al.,19 and John et al.,20 have seen a positive association between carcinoma prostate and family history. Failure of present study to find an association between family history and CaP might be owing to, lacking of awareness among the population, hence they failed to report proper history; sample size in case of present study; lack of awareness among the previous generations towards importance of seeking medical advice given the symptoms and lastly, lack of medical facilities in the time of older generations.

CONCLUSIONS
We failed to find significant association between socio-economic status and BPH and CaP cases. Although, the present study was not able to find significant associations of personal data parameters (except skilled labourers) and anthropometric measurements (except weight and BMI) with BPH and CaP, they may be one of the contributing factors for them if explored further on a larger scale.

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REFERENCES


Address for correspondence:
Dr. Zehra Naz, 25-A, Lane 3, Tulsa Road, Lalazar, Rawalpindi. Tel: +92-51-9240965, Cell: +92-333-3392924 Email: zehranaz@hotmail.com